UNITED STATES DISTRICT COURT
FOR THE
DISTRICT OF VERMONT

UNITED STATES OF AMERICA	:	
	:	
v.	:	Case No. 2:13-cr-165
	:	
BRETT LAWTON, DEVIN MESSIER, and TOM ARBUCKLE,	:	
	:	
Defendants.	:	

OPINION AND ORDER

Defendants Brett Lawton, Devin Messier, and Tom Arbuckle are charged with distributing alpha-PVP ("a-PVP"), a schedule I controlled substance analogue, in violation of 21 U.S.C. §§ 813, 841(a)(1), and 846 ("the Analogue Act"). Defendants have filed a joint motion to dismiss the indictment, arguing that the cited portions of the Analogue Act are unconstitutionally vague as applied to the facts of this case. Specifically, defendants contend that the law did not provide them fair warning of potential prosecution for distributing a-PVP as an analogue of MDPV. Defendants have also moved *in limine* to exclude expert testimony with respect to the alleged similarities between a-PVP and MDPV.

For the reasons set forth below, defendants' motions are **denied**.

I. Defendants' Joint Motion to Dismiss

A. The Analogue Act

Defendants are charged with conspiring to distribute a-PVP (alpha-Pyrrolidinovalerophenone), which is allegedly an analogue

to MDVP (3,4-methylenedioxyprovalerone). MDVP is a schedule I controlled substance. Federal drug law defines an analogue as a substance:

> (i) the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II;
>
> (ii) which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II; or
>
> (iii) with respect to a particular person, which such person represents or intends to have a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II.

21 U.S.C. § 802(32)(A). The Second Circuit has determined that these provisions should be read in the conjunctive:

> According to the conjunctive reading, the definition requires two things: first, (i) that the substance be chemically similar and, second, (ii) that it have a similar or greater psychopharmacological effect or (iii) that it be intended to have or be represented as having such an effect.

United States v. Roberts, 363 F.3d 118, 120 (2d Cir. 2004).

Defendants contend that a-PVP and MDVP are not analogous. In support, they have submitted two expert reports highlighting the differences between the substances. Based upon these reports, defendants argue that the Analogue Act failed to provide them fair notice of likely prosecution, thereby violating their

rights under the Fifth Amendment. The government's experts contend that the two substances are substantially similar with regard to both their chemical makeup and their psycho-pharmacological effects.

B. Comparing a-PVP with MDPV

According to government expert Thomas DiBerardino, Ph.D.,[1] a-PVP and MDPV share the same chemical structure, known as phenethylamine. Both substances also have an oxygen atom substituted at the same position of their core chemical structures, meaning that they can each be classified as beta-keto-phenethylamines. According to Dr. DiBerardino, other similarities include an alkyl group substitution at the alpha position, and an alkyl group substitution on the nitrogen atom. Dr. DiBerardino's report states that the only feature distinguishing the two substances is the substitution of methylenedioxy in one location on MDPV. Two-dimensional representations of the substances are reportedly similar, and Dr. DiBerardino's evaluation of the three-dimensional structures does not alter his conclusion as to substantial similarity. According to the government, there is no dispute that a-PVP and MDPV differ by only three atoms.

The government's second expert, pharmacologist-toxicologist

[1] The government's experts are employed at the Drug Enforcement Agency's Office of Diversion Control, Drug & Chemical Evaluation Section.

Ambuja Bale, Ph.D., will testify about the drug's neurological effects. Briefly stated, Dr. Bale concludes that a-PVP has a stimulant effect on the nervous system that is similar to that of MDVP. Her conclusions are based primarily upon animal studies.

Defendants' experts contend that the two drugs have significantly different chemical structures. Dr. Nicolas Cozzi, Ph.D.,[2] states that while Dr. DiBerardino emphasizes a two-dimensional similarity in the chemical structure, a three-dimensional view evidences significant differences. The Cozzi Declaration, and that of defense expert Joseph Bono,[3] also submit that there is no scientific consensus about the term "substantially similar."

Dr. Cozzi concludes that rather than being an analogue for MDPV, a-PVP is more closely related to pyrovaleron, a Schedule V controlled substance. Dr. Cozzi also believes that because there is no clinical human data comparing the effects of a-PVP and MDPV, "it is not possible to directly answer whether a-PVP produces a response in humans that more closely matches the effects produced by MDPV or those produced by pyrovalerone." ECF No. 77-1 at 5. Anecdotal evidence, however, reportedly indicates

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[2] Dr. Cozzi is the Director of the Neuropharmacology Laboratory at the University of Wisconsin School of Medicine and Public Health.

[3] Mr. Bono is a forensic chemist, former Laboratory Director of the United States Secret Service Laboratory in Washington D.C., and former Director of the Drug Enforcement Agency Special Testing and Research Laboratory.

"that MDPV is at least 6-12 times *more potent* than either a-PVP or pyrovalerone." *Id.* at 6 (emphasis in original).[4]

C. Fair Notice

Fair notice, pursuant to the Fifth Amendment's guarantee of due process, requires a penal statute to "define the criminal offense (1) with sufficient definiteness that ordinary people can understand what conduct is prohibited and (2) in a manner that does not encourage arbitrary and discriminatory enforcement." *Kolender v. Lawson*, 461 U.S. 352, 357 (1983); *see also Skilling v. United States*, 561 U.S. 358, 402-03 (2010). The first prong of the *Kolender* test, requiring adequate notice, "is based on the principle that no one 'shall be held criminally responsible for conduct which he could not reasonably understand to be proscribed.' *United States v. Harriss*, 347 U.S. 612, 617 (1954)." *Roberts*, 363 F.3d at 122. The second prong requires "minimum guidelines" to prevent "a standardless sweep that allows policemen, prosecutors, and juries to pursue their personal predilections." *Kolender*, 461 U.S. at 358.

The Second Circuit has twice considered as-applied, *Kolender*-based challenges to the Analogue Act. In *United States v. Roberts*, 363 F.3d 118 (2d Cir. 2004), the government claimed that 1,4-butanediol was an analogue to GHB, a schedule I

[4] There is no dispute that, since the conduct alleged in this case, a-PVP has been listed as a Schedule I controlled substance.

controlled substance. The district court dismissed the indictment after a pre-trial hearing, concluding that the Analogue Act was vague as applied and did not provide defendants fair notice of potential prosecution. The Second Circuit reversed.

The *Roberts* decision first concluded that because the Analogue Act contains a scienter requirement, "the defendants' vagueness challenge must be met with some measure of skepticism, at least with regard to the 'fair notice' prong of *Kolender*." 363 F.3d at 123 (citation omitted). "That skepticism is further buttressed by the government's proffer that the defendants actually believed what they were doing was illegal." *Id.* A similar proffer has been made here, as the government submits that "trial evidence is expected to confirm that the defendants understood they were dealing with illegal controlled substances, thus undermining their claim to have been unconstitutionally surprised by their prosecution." ECF No. 83 at 6.

Roberts then "put[] aside these considerations" to determine whether the phrase "substantially similar [in] chemical structure" was unconstitutionally vague as applied to 1,4-butanediol. 363 F.3d at 123. With respect to clause (i) of Section 802(32)(A), the government urged the court to find substantial similarity in chemical structures based solely upon a review of two-dimensional molecular diagrams, which revealed a

two-atom difference. The court declined to accept this comparison as *per se* evidence of a similar chemical structure. As the court explained, "[i]n another case, it might well be that a one- or two-atom difference in a molecule made such a radical difference in the substance's relevant characteristics that any similarity in the two-dimensional charts" would be insufficient to satisfy the definition of an analogue. *Id.* The court then considered that 1,4-butanediol metabolizes into GHB after ingestion. The court found the totality of these facts, *i.e.* similar diagrams and metabolization, constitutionally sufficient. *Id.*

The Second Circuit subsequently addressed a similar set of facts in *United States v. Ansaldi*, 372 F.3d 118 (2d Cir. 2004). There, the government's expert "offered uncontroverted testimony" that the chemical structure of GBL, the alleged analogue, "differed from that of GHB by only three atoms." *Ansaldi*, 372 F.3d at 124. The expert also testified that GBL metabolizes into GHB post-ingestion. The court concluded that "[o]n these facts . . . the decision in *Roberts* makes clear that Defendants had sufficient warning that GBL was a controlled substance analogue and that its distribution for human consumption was illegal." *Id.*

In this case, there is arguable similarity in the two-dimensional molecular diagrams for a-PVP and MDPV, and as in

Ansaldi, a reported difference of "only three atoms." Furthermore, the evidence with respect to psycho-pharmacological effects of the two substances suggests that, at least as demonstrated in animal studies, those effects are similar. There is no suggestion by either party, however, that a-PVP metabolizes into MDPV post-ingestion.

Defendants argue that *Roberts* "requires" such metabolization in order to show similarity. ECF No. 77 at 9. The government counters that there is no such requirement, and that *Roberts* merely declined to accept a comparison of two-dimensional diagrams, standing alone, as the test for determining similarity "in every situation." *Roberts*, 363 F.3d at 124. Indeed, nowhere in the *Roberts* decision does the Second Circuit explicitly require both similarities in atomic structure *and* metabolization as requirements for substantial similarity.

In declining to accept a two-dimensional structural similarity as the sole proof of an analogue, *Roberts* was concerned about "another case" where, despite structural similarities, the differences between two substances "might well" result in different "relevant characteristics." *Id.* Whether the substances in this case contain such differences has not been established. At most, the relevant characteristics of the two substances, together with the question of structural similarity, are matters of dispute among the experts. Those disputes may be

resolved by a jury. *See, e.g., United States v. Klecker*, 348 F.3d 69, 72 (4th Cir. 2003) ("Whether a particular substance qualifies as a controlled substance analogue is a question of fact."); *United States v. Long*, 15 F. Supp. 3d 936, 942 (D.S.D. 2014) ("A disagreement regarding the degree of similarity between a controlled substance and its alleged analog, as the experts [in *Long*] have, is for the jury to decide.").[5]

Defendants next argue that the Analogue Act is unconstitutionally vague because the term "substantially similar" was not defined by Congress, and no definition exists in the scientific community. Courts have held, however, that "there is no indication that Congress intended the words 'substantially similar' to have a specialized or scientific meaning." *United States v. Reece*, 2013 WL 3865067, at *9 (W.D. La. July 24, 2013). "Therefore, these words should be given their ordinary meanings." *Id.*; *see also United States v. Turcotte*, 405 F.3d 515, 531 (7th Cir. 2005) (concluding that "the Analogue Provision seems to us sufficiently clear by its own terms"); *United States v. Brown*, 279 F. Supp. 2d 1238, 1240-41 (S.D. Ala. 2003), *aff'd* 415 F.3d 1257 (11th Cir. 2005) ("Since the Analogue Act does not indicate that the term 'substantially similar' is to be defined as it is

[5] *Ansaldi* noted, in the context of the Analogue Act, that "[j]uries are often required to determine not only whether certain conduct occurred but also whether the conduct falls within the definition of a statute." 372 F.3d at 123 n.2.

used scientifically, the court will interpret those words as they are used in everyday language.").

Defendants also contend that the purpose of the Analogue Act is to combat the production of new substances that mimic the effects of Schedule I or II controlled substances, and that a-PVP falls outside the focus of the Act because it has was patented in 1967. When confronted with this argument regarding 1,4-butanediol (the same analogue presented in *Roberts*), the Eighth Circuit concluded that "Congress did not limit the Analogue Statute's application to newly designed drugs. The language of the statute shows that Congress intended to proscribe all drugs that are similar in chemical structure and effect to illegal drugs." *United States v. Washam*, 312 F.3d 926, 933 (8th Cir. 2002). Moreover, *Roberts* concluded that "the wording of the Act evinces a clear congressional intent not to limit its scope to . . . designer drugs." 363 F.3d at 126.

Finally, defendants argue that the lack of an accepted definition for substantial similarity presents the danger of arbitrary enforcement, thereby violating due process. Again, courts have generally found that no such accepted definition is required. Furthermore, *Roberts* concluded that the meaning of "'controlled substance analogue'" was sufficient to meet the second *Kolender* requirement that "a criminal offense be defined 'in a manner that does not encourage arbitrary and discriminatory

enforcement.'" *Id.* (quoting *Kolender*, 461 U.S. at 357).

For these reasons, defendants' joint motion to dismiss the indictment (ECF No. 77) is **denied**.

II. Defendants' Motion *In Limine* to Exclude Expert Testimony

Defendants have also moved under *Daubert* to exclude testimony from the government's experts regarding substantial similarity. The admissibility of expert testimony in the federal courts is governed by Federal Rule of Evidence 702, which provides in pertinent part:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Fed. R. Evid. 702. Rule 702 embodies a liberal standard of admissibility for expert opinions. *See Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 588-89 (1993).

In *Daubert*, the Supreme Court set forth a series of factors for determining whether expert testimony rests upon a sufficiently reliable foundation:

> (1) whether a theory or technique "can be (and has been) tested"; (2) "whether the theory or technique has been subjected to peer review and publication"; (3) a technique's "known or potential rate of error," and the "existence and maintenance of standards controlling the technique's operation"; and (4) whether a particular

> technique or theory has gained "general acceptance" in the relevant scientific community.

Amorgianos v. Nat'l R.R. Passenger Corp., 303 F.3d 256, 265 (2d Cir. 2002) (quoting *Daubert*, 509 U.S. at 593-94). "[T]hese factors do not constitute, however, a 'definitive checklist or test,'" as "'[t]he inquiry envisioned by Rule 702 is . . . a flexible one.'" *Id.* (quoting *Daubert*, 509 U.S. at 593-94).

Here, defendants argue that the absence of an accepted definition of substantial similarity means that there is no proven or peer-reviewed testing method. Defendants also attack the opinions of the government's experts for lack of general acceptance in the scientific community. Third, defendants criticize opinions based upon animal studies as "conjecture." ECF No. 78 at 6. While the government counters that the determination of substantial similarity does not require a scientific definition, defendants claim this argument supports their assertion that "there is no need for expert testimony on this non-technical and non-scientific question." ECF No. 85 at 5. Indeed, at oral argument defendants urged the Court to bar expert conclusions as to substantial similarity, arguing that such conclusions were strictly within the province of the jury.

As discussed above, courts have generally held that "substantially similar" does not require a scientific definition. That said, the lack of a scientific meaning does not render expert conclusions about substantial similarity either

unnecessary or improper. Rule 702 permits testimony from persons with "specialized knowledge [that] will help the trier of fact to understand the evidence." Fed. R. Evid. 702(a). *Daubert* similarly noted that expert testimony may be admitted to "assist the trier of fact to understand the evidence or to determine a fact in issue." 509 U.S. at 589. In this case, the parties have presented experts to help the jury consider both similarities and differences in two chemical structures, as well as the reliability of data about pharmacological effects. As there is no challenge to the qualifications of these experts, the Court finds that they have the "specialized knowledge" envisioned by Rule 702, and that their presentations to the jury will aid in determining critical questions of fact.

"[E]xpert testimony is not helpful if it simply addresses 'lay matters which the jury is capable of understanding and deciding without the expert's help.'" *In re Fosomax Prod. Liab. Litig.*, 645 F. Supp. 2d 164, 173 (S.D.N.Y. 2009) (quoting *United States v. Lumpkin*, 192 F.3d 280, 289 (2d Cir. 1999)). Expert testimony also may not "'usurp either the role of the trial judge in instructing the jury as to the applicable law or the role of the jury in applying that law to the facts before it.'" *United States v. Duncan*, 42 F.3d 97, 101 (2d Cir. 1994) (quoting *United States v. Bilzerian*, 926 F.2d 1285, 1294 (2d Cir. 1991)). Here, there can be little question that expert testimony will help the

jury understand complex chemical structures. As suggested by the *Roberts* decision, diagrams alone may not reveal the relevant characteristics of a substance, and expert analysis will surely educate the jury with regard to those characteristics. Furthermore, expert conclusions as to substantial similarity will not usurp the role of either the judge or the jury, as that term is traditionally afforded a lay definition, and jurors will be able to weigh the expert testimony and conclude whether a-PVP is, in fact, an analogue.

To the extent there is a lack of peer-reviewed materials and a reliance upon animal studies, those issues go to weight rather than admissibility. *United States v. Bays*, 2014 WL 3764876, at *9 (N.D. Tex. July 31, 2014) (citation omitted). Moreover, expert opinions from DEA scientists, as offered by the government in this case, are "widely accepted by courts" in Analogue Act cases. *Id.* at *7 (N.D. Tex. July 31, 2014) (citing *United States v. Makkar*, 2014 WL 1385298, at *3 (N.D. Okla. Apr. 9, 2014) (noting that the "identification and comparison of chemical substances are not novel scientific issues")). The Court therefore declines to bar the government's experts for lack of either general acceptance or peer-reviewed methodologies. *See, e.g., United States v. Brown*, 415 F.3d 1257, 1267 (11th Cir. 2002) (emphasizing flexible nature of the *Daubert* inquiry in affirming the trial court's admission of expert testimony

regarding chemical structure).

Finally, differences of opinion among experts do not render those opinions unreliable. *See Washam*, 312 F.3d at 932 (noting that "experts need not agree for there to be a finding that a chemical is an analogue"). The government focuses upon a two-dimensional model, while defendants prefer a three-dimensional perspective. As the district court found in *Bays*, "there is no one avenue that an expert must take to determine whether two chemical compounds are substantially similar." 2014 WL 3764876, at *7 (citing as examples *Ansaldi*, 372 F.3d at 123-24 and *Roberts*, 363 F.3d at 124-27). *Bays* also concluded that "determining which approach is best is not this Court's charge." *Id.* (citing *Ruize-Troche v. Pepsi-Cola of P.R.*, 161 F.3d 77, 85 (1st Cir. 1998) ("*Daubert* neither requires nor empowers trial courts to determine which of several competing scientific theories has the best provenance.")).

The advisory committee note to Rule 702 asserts that "rejection of expert testimony is the exception rather than the rule." In this case, experts will be expressing their opinions about the science of two chemical substances, and summarizing those opinions by using a lay term: substantial similarity. Such testimony is proper under the Federal Rules of Evidence, and defendants' motion *in limine* to exclude expert testimony is **denied**.

III. Conclusion

For the reasons set forth above, defendants' joint motion to dismiss the indictment (ECF No. 77) and motion *in limine* to exclude expert testimony (ECF No. 78) are **denied.**

Dated at Burlington, this 9th day of January, 2015.

/s/ William K. Sessions III
William K. Sessions III
District Court Judge